UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/722,701	11/25/2003	Oleg Kiselev	VRT0106US	7436

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EXAMINER
DAYE, CHELCIE L

ART UNIT	PAPER NUMBER
2161	

DATE MAILED: 08/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/722,701	KISELEV, OLEG
	Examiner	Art Unit	
	Chelcie Daye	2161	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>25 November 2003</u>.
2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *1-21* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☒ The drawing(s) filed on <u>25 November 2003</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a)☐ All b)☐ Some * c)☐ None of:
      1.☐ Certified copies of the priority documents have been received.
      2.☐ Certified copies of the priority documents have been received in Application No. _____.
      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>5/3/04 & 10/19/04</u>.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1.   This action is issued in response to Application filed November 25, 2003.

2.   Claims 1-21 are pending.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 5/03/04 and

10/19/04 was filed after the mailing date of the application on 11/25/03. The

submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the

information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 112

3.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter, which the applicant regards as his invention.

4.   Claims 1,3,10-13,16,and 19-21 are rejected under 35 U.S.C. 112, second

paragraph, as being indefinite for failing to particularly point out and distinctly

claim the subject matter which applicant regards as the invention.

The term "if" in claims 1,3,10-13,16,and 19 is a relative term, which

renders the claims indefinite. The term "if" is considered alternative language, the

specification does not provide a standard for ascertaining the requisite degree,

and one of ordinary skill in the art would not be reasonably apprised of the scope

of the invention. Due to the language of the above stated claims, Examiner is

unsure of what the outcome would be if the statement were not applied.

Therefore, the above stated claims will be examined without giving weight to the

term "if".

Claims 20 and 21 are rejected under 35 U.S.C. 112, second paragraph,

for improper dependency. The claims as stated above, fail to stay consistent with

the statutory matter as stated. The statutory class of claim 20 is a "computer-

readable medium", however the claim is depending from claim 1 which is a

method claim. Also, claim 21 is rejected because of its dependency from claim

20. Therefore, applicant is required to cancel the claim(s), or amend the claim(s)

to place the claim(s) in proper dependent form

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for

all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described
> as set forth in section 102 of this title, if the differences between the subject matter sought to
> be patented and the prior art are such that the subject matter as a whole would have been
> obvious at the time the invention was made to a person having ordinary skill in the art to which
> said subject matter pertains. Patentability shall not be negatived by the manner in which the
> invention was made.

6.   **Claims 1-10 and 13-21 are rejected under 35 U.S.C. 103(a) as being**

unpatentable over DeKoning (US Patent No. 6,691,245) filed October 10,

2000, in view of Takeda (US Patent Application No. 20040172509) filed June

23, 2003.

Regarding Claims 1,13,16,and 19, DeKoning discloses a method

comprising:

receiving a request to read a portion of data from first data storage

(column 5, lines 20-29, DeKoning), wherein a first host can access the first

data storage (Fig.1; column 6, lines 26-28, DeKoning)[1], and the first host

cannot access second data storage (column 6, lines 45-55, DeKoning)[2];

requesting a requested portion of a copy of the data in the second

data storage from a second host that can access the second data storage

(Fig.1; column 6, lines 63-67 and column 7, lines 1-5 & 22-40, DeKoning);

and

receiving the requested portion from the second host (column 9,

lines 39-62, DeKoning). However, DeKoning is silent with respect to

reading the portion of the data by reading the requested portion received

from the second host, and if a sub-portion of the portion of the data is

available from the first data storage and the sub-portion was not included

in the requested portion, reading the sub-portion from the first data

storage. On the other hand, Takeda discloses reading the portion of the

data by reading the requested portion received from the second host

([0061-0062], Takeda), and if a sub-portion of the portion of the data is

available from the first data storage and the sub-portion was not included

in the requested portion, reading the sub-portion from the first data

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[1] Examiner Notes: Within Fig.1, item 106 represents the first host and item 108 represents the first data storage. Also, communication link 118 demonstrates how the first host has access to the first data storage.

[2] Examiner Notes: As stated within column 6, lines 45-55, if a disaster disrupts the first data storage and/or the first host, the second host and second data storage will not be affected, because they are storage at a remote location. Also, as seen within Fig.1, the first host 106 is connected to the first data storage 108, only, and the first data storage connects to the second

storage ([0064], Takeda). DeKoning and Takeda are analogous art because they are from the same field of endeavor of data storage with remote mirrors. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate Takeda's teachings into the DeKoning system. A skilled artisan would have been motivated to combine as suggested by Takeda at [0005] and [0012], in order to devise a technology where a plurality of storage subsystems connected through a network, are managed collectively and provided to the user as a plural subsystem. Thereby, allowing the user to use the plurality of storage subsystems as if it were a single storage subsystem, allowing for less trafficking to the hosts.

Regarding Claims 2,14,17,and 20, the combination of DeKoning in view of Takeda, disclose the method further comprising:

determining that a second portion of the data in the first data storage is unavailable (column 10, lines 51-54, DeKoning);

creating a third data storage upon performing the determining, wherein the first host can access the third data storage ([0139], Takeda), and

causing each subsequent change to the data in the first data storage to be written to the third data storage ([0140], lines 3-10, Takeda).

data storage 110, by communication link 122. As can be seen there is no direct link (i.e. access)

Regarding Claims 3,15,18,and 21, the combination of DeKoning in

view of Takeda, disclose the method wherein

if the portion of the data comprises an updated portion in the third

data storage, the reading the portion of the data comprises reading the

updated portion from the third data storage ([0140], Takeda)[3].

Regarding Claim 4, the combination of DeKoning in view of

Takeda, disclose the method wherein the second portion of the data is

unavailable because the second portion of the data is corrupted (column

5, lines 34-43, DeKoning).

Regarding Claim 5, the combination of DeKoning in view of

Takeda, disclose the method wherein the second portion of the data is

unavailable because a device of the first data storage is unavailable

(column 5, lines 34-43, DeKoning).

Regarding Claim 6, the combination of DeKoning in view of

Takeda, disclose the method further comprising:

replicating data in the third data storage to fourth data storage

accessible by the second host ([0141], lines 1-4, Takeda)[4], wherein the

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from the first host 106 to the second data storage110.

[3] Examiner Notes: Fig.8, item 60, corresponds to the third data storage.

[4] Examiner Notes: Fig.8, item 62, corresponds to the fourth data storage.

fourth data storage cannot be accessed by the first host (column 6, lines 45-55, DeKoning).

Regarding Claim 7, the combination of DeKoning in view of Takeda, disclose the method wherein the copy of the data in the second data storage was copied from a previous version of the data in the first data storage at a previous point in time (column 6, lines 3-21, DeKoning).

Regarding Claim 8, the combination of DeKoning in view of Takeda, disclose the method wherein

the data in the second data storage is a log of changes made to data in the first data storage after a previous point in time (column 7, lines 22-40, DeKoning); and

the requested portion is a set of changes in the log of changes, wherein each change in the set of changes comprises a change to the portion of the data, wherein the change was made after the previous point in time (column 8, lines 18-31, DeKoning).

Regarding Claim 9, the combination of DeKoning in view of Takeda, disclose the method wherein the requesting the requested portion comprises:

identifying a set of changed regions of a first plurality of regions of the first data storage using a set of indicators, wherein each indicator of

the set indicates whether at least one change was made to data in a

respective region of the first data storage (column 8, lines 22-44,

DeKoning), and;

adding each region of the set of changed regions to the requested

portion (Fig.3; column 8, lines 18-21, DeKoning).

Regarding Claim 10, the combination of DeKoning in view of

Takeda, disclose the method further comprising:

determining whether the data in each region of the first plurality of

regions of the first data storage is synchronized with the copy of the data

in a corresponding region of a second plurality of regions of the second

data storage (column 8, lines 24-33, DeKoning); and

if the data in one region of the first plurality of regions is not

synchronized with the copy of the data in the corresponding region of the

second plurality of regions, identifying a set of unsynchronized regions of

the first data storage, wherein each region in the set of unsynchronized

regions is unsynchronized with a corresponding region of the second data

storage ([0069], Takeda), and

forcing replication of the data in the set of unsynchronized regions

to the copy of the data in the second data storage prior to requesting the

requested portion ([0073-0074], Takeda).

7.   **Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being**

unpatentable over DeKoning (US Patent No. 6,691,245) filed October 10,

2000, in view of Takeda (US Patent Application No. 20040172509) filed June

23, 2003 as applied to claims 1-10 and 13-21 above, and further in view of

Carlson (US Patent No. 6,377,959) filed May 20, 1996.

Regarding Claim 11, the combination of DeKoning in view of

Takeda, disclose the method wherein

the determining whether the data in each region of the first data

storage is synchronized with the copy of the data in the corresponding

region of the second data storage (column 8, lines 24-33, DeKoning).

However, the combination of DeKoning in view of Takeda are silent with

respect to determining whether a lag in replication from the first data

storage to the second data storage exists, and if the lag exists,

determining that the first data storage and the second data storage are

unsynchronized. On the other hand, Carlson discloses determining

whether a lag in replication from the first data storage to the second data

storage exists (column 7, lines 64-67, Carlson), and if the lag exists,

determining that the first data storage and the second data storage are

unsynchronized (columns 7-8, lines 67 and 1-10, respectively, Carlson).

DeKoning, Takeda, and Carlson are analogous art because they are from

the same field of endeavor of database recovery procedures. It would

have been obvious to one of ordinary skill in the art at the time of the

invention to incorporate Carlson's teachings into the DeKoning in view of

Takeda system. A skilled artisan would have been motivated to combine

as suggested by Carlson at column 2, lines 59-67, in order to satisfy a

need within the art for a dual database system that maintains two

databases with identical entries for fault tolerance. Therefore, providing an

active database system which copies one record at a time while

interleaving updates into the operation stream at the redundant database,

thereby allowing the databases to be concurrent.

Regarding Claim 12, the combination of DeKoning in view of

Takeda, and further in view of Carlson, disclose the method wherein the

determining whether the lag in replication from the first data storage to the

second data storage exists comprises:

examining a replication map for the first data storage, wherein the

replication map comprises an indicator for each region of the first plurality

of regions, the indicator for each region indicates whether data in a

respective region of the first data storage have changed but have not yet

been replicated (column 8, lines 22-44, DeKoning); and

if at least one respective region of the first plurality of regions has

the indicator, determining that the lag exists (column 7, lines 64-67,

Carlson).

Points of Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chelcie Daye whose telephone number is 571-272-3891. The examiner can normally be reached on M-F, 7:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Gaffin can be reached on 571-272-4146. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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